

## REMARKS

This Amendment responds to the Office Action dated March 26, 2004. Based upon the foregoing amendments and following comments, Applicant respectfully requests reconsideration and allowance of the application. Applicants are appreciative of Examiner's acknowledgement that the subject matter of claims 9, 11, 13, 14, 17, 18, 20, and 21 is allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In accordance with those acknowledgements, new independent claims 22-25 have been added. Claim 22 includes the subject matter of independent claim 7 and original dependent claims 8 and 9. New independent claim 23 includes the subject matter of original claims 7, 10, and 11. Newly added independent claim 24 includes the subject matter of original claim 7 and original dependent claims 12 and 13. Lastly, new independent claim 25 has been added and includes the subject matter of original claims 15-17. Applicant submits that no new matter has been added. As such, no new issues are presented with the submission of these new claims, thus no new searches are required.

By way of this amendment, claims 3 and 8 are canceled. The subject matter of claim 3 has been incorporated into independent claim 1. The subject matter of claim 8 has been incorporated into independent claim 7. Dependent claim 9 has been amended to properly dependent from claim 7. The cancellation of the aforementioned claims should in no way be construed as an acquiescence to any of the rejections stated in the Office Action. These claims are canceled solely to expedite the prosecution of the present application. Accordingly, claims 1-2, 4-7, and 9-25 are under consideration. As a result of this amendment, 23 total claims and 7 independent claims are now pending. The fee for consideration of two additional claims and four additional independent claims is included herewith.

### 35 U.S.C. §102(e) Rejections

Claims 7, 8, and 15 stand rejected under 35 U.S.C. §102(e) as anticipated by Kim et al. (U.S. Patent Application Publication 2003/0052083.) Applicant respectfully traverses these rejections. Under Section 2131, the MPEP directly states: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). Applicant submits that the present invention, as now claimed, is neither expressly nor inherently described in the teachings of Kim et al.

As understood by one with ordinary skill in the art, and as clearly disclosed within the teachings of Kim et al., the Kim et al. system's manipulation and mathematical operations do not expressly or inherently describe a diagnosis of a chemical sensor and a chemical detection system. Rather, the methods taught within the cited reference disclose essential steps or procedures for evaluating the condition of a substrate processing chamber and subsequently treating the chamber to achieve satisfactory processing results. *See* para. 008; *see also* para. 0020; *see also* para. 0023; *see also* para. 0025. That is, the system being evaluated is not a chemical detection system as contemplated and claimed by Applicant. Applicant respectfully submits that the methods described in Kim et al. merely provide a functional evaluation of the processing chamber – not a diagnosis of a flow system and the detection capabilities (i.e. the chemical sensor) of the system.

Specifically, the operational routines described in the teachings of Kim et al. are purported to determine the inherent residual constituents accumulated upon the chamber walls prior to or during substrate processing. Kim et al. does not, in any manner, describe a method or apparatus to address the integrity of the chemical detection system or the “chemical sensor” disclosed within cited reference. One skilled in the art recognizes that the sub-components of the apparatus disclosed by Kim et al. analogous to a chemical detection

system and/or chemical sensor consist of: a radiation detector, a gas energizer, a processing chamber, and a flow system wherein the “chemical sensor” consists of the radiator detector and the gas energizer. The evaluation methods proposed by Kim et al. are limited to monitoring the condition of the chamber, and are not directed to diagnosing or verifying the operation of the radiation detector, the gas energizer, or the flow system. See para. 0025-0041. Most significantly, one with ordinary skill in the art further appreciates that the teachings of Kim et al. presume that the radiation detector, the gas energizer, and the flow system are generally operational. Again, nowhere within the cited reference is determining the performance or integrity of the “chemical sensor” contemplated. The analysis of the data collected by Kim et al. is used expressly for the purpose of “seasoning” the processing chamber – not verification of system/sensor integrity. Clearly, Kim et al. does not expressly teach or even suggest a method or an apparatus sufficient to verify the performance of the “chemical sensor” or attempt, in any fashion, to determine the fault conditions associated with the “chemical sensor.”

Quite the opposite, Applicant has disclosed, and now claims, a method for verifying the operation of a chemical detection system. Specifically, newly amended claim 7 recites a method for verifying the operation of a chemical detection system wherein diagnostic routines include controlling the exposure of a chemical sensor while taking measurements of surrounding environmental conditions to derive data representative of the chemical sensors response. Applicant’s invention utilizes the representative data as *diagnostic data* to confirm flow of an emission enriched flow and an emission deprived flow in conjunction with a diagnosis of the chemical sensor’s operation.

Similarly, the method recited in independent claim 15 has been amended such that the diagnostic steps are used to determine *fault conditions of a chemical sensor*. Clearly, the cited reference does not expressly or inherently teach the diagnosis of the “chemical sensor”

with the substrate processing system. Inapposite to the present invention, Kim et al. assumes that the chemical sensor is functional and operational when determining the residual constituents of the sputtering chamber. There is no diagnosis of the chemical sensing system or chemical sensor taught by Kim et al. Further, as Applicant had disclosed in the original specification, numerous prior art systems generally provide a surrogate analyte to confirm operation of the sensing system and/or chemical sensor. Even this teaching is absent in Kim et al. As such, Applicants respectfully submit the cited reference cannot anticipate the present invention and the claimed subject matter, as now amended, is in condition for allowance.

### **35 U.S.C. §103 Rejections**

Claims 1-3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kim et al. in view of Baghel et al. (USP 6,272,938). Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kim et al. in view of Brace et al. (USP 4,726,225). Claims 5-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kim et al. in view of Baghel et al. in further view of Lewis et al. (USP 6,455,310). Claims 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Kim et al. in view of Sato et al. (USP 5,541,851). Claims 12 and 19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kim et al. in view of Lewis et al. Lastly, claim 16 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Kim et al. in view of Brace et al. Applicant respectfully traverses these rejections. Applicants' methods and apparatus, as claimed, are neither anticipated by Kim et al. nor obvious in view of the above cited references in regards to Kim et al. *See In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974) (*i.e.*, all the claim limitations must be taught or suggested in the prior art).

Applicant submits that the foregoing amendments to the claims have rendered the rejections based upon Kim et al. moot. As such, any rejections in combination with Kim et

al. should be withdrawn. Specifically, independent claim 1 has been amended to include a diagnostic routine which comprises *confirming the flow of an emission and a flow of atmosphere that does not contain a substantial amount of the emission and confirming the operation of the chemical sensor* within a chemical detection system. As previously explained, Applicant's method and apparatus are neither anticipated nor obvious in view of the cited reference. Not only are the teachings of Kim et al. inapplicable for diagnosing flow through the described chemical detection system, but the teachings clearly presume that the "chemical sensor" is always functional. The assumptions of Kim et al. are most clearly demonstrated in the lack of testing and analysis to verify the integrity of the sensor of the detector when describing both open-loop and closed-loop operation of the measurement system. There is simply no consideration of fault conditions that may occur within the "chemical sensor." See para. 0025-0027. Furthermore, Applicant respectfully submits that teachings of Kim et al. never contemplate the issues of fault conditions that may occur with the flow system inherent to processing system confirmation. One skilled in the art clearly recognizes that the teachings of Kim et al. in view of the aforementioned references do not suggest or imply the manipulation of a chemical detection system and chemical sensor for the purpose of diagnosing fault conditions within the system and/or sensor.


Applicants respectfully submit that the amendments and remarks presented herein have placed the application in condition for allowance. Applicant respectfully requests withdrawal of these rejections and reconsideration of the pending claims 1-2, 4-7, and 9-21.

## Conclusion

For the reasons stated above, Applicant submits that the specification and claims are in proper form and clearly define patentable subject matter with respect to the prior art. If there are any additional fees or refunds required, the Commissioner is directed to charge or debit Deposit Account No. 13-2855 of Marshall, Gerstein & Borun LLP.

Respectfully submitted for,

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